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Creative approaches in sustainable fashion design

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Abstract. Today, humanity is increasingly concerned with finding effective solutions to reduce pollution and manage waste. Globally, the fashion and textile industry is one of the biggest polluters. In this context, the paper presents the main principles that designers can approach to create sustainable clothing prototypes or fashion collections. However, in order for a clothing product to be attractive to potential buyers, it must not only be sustainable, it must also meet both practical and aesthetic needs. So, all the stated principles were tested with the students from Fashion – Design department within the Faculty of Visual Arts and Design, National University of Art "G. Enescu" from Iasi, Romania. Some of the results obtained are presented in this paper and they demonstrate that, through creativity, solutions can be found in designing sustainable and interesting outfits, which can be easily included in the fashion circuit.
Keywords: *fashion design, zero waste, upcycling, experiment*

1. Introduction

Today's fashion system is based on excessive consumerism and materialism. Although consumerism, by its very definition, promised a win-win situation for everyone, the fashion and textile industry ended up being one that exploits (the natural resources, the people) being well known that this is one of the biggest polluters of the planet.

From fiber to the finished product and to the end of its life, every stage of production, promotion, marketing, maintenance and (finally) disposal, involves pollution. 10 years ago, humanity produced approximately 92 million tons of textile waste annually, and it was estimated, at that time, that this amount would increase by 60 percent until 2030. Certainly, solutions to reduce pollution exist and attempts are being made to implement them, both in the production and marketing stages, as well as in the waste management stage. According to statistics, an important percentage of the environmental impact of a product results from the design process. Refusing to use animal products (skins or furs) and textile materials whose production process is a polluting or resource-consuming one or choosing only one type of fabric for a product (a fact that increases its recycling capacity), may be solutions. But, in addition to these, designers also have a series of principles that they can rely in order to design products or entire collections in a sustainable way. Educating students from specialized universities in the spirit of sustainability is a very important aspect, even a necessity, which can form, in the future, generations of designers with a positive impact on the environment. In this sense, over the years, the approach of projects in which the principles of sustainable design were applied has been a constant concern of the Fashion - Design specialization from the Faculty of Visual Arts and Design, Iași.

2. Collaborative exercises

The concept of sustainable fashion (component of the sustainable economy) involves several directions: the production based on zero waste principle, the production of multifunctional products, use of upcycling principle.

2.1. It is estimated that 15% of the textile waste generated by the fashion industry results from the cutting stage. Applying the zero waste principle, they are eliminated at the design stage.

People have created garments using this principle since ancient times, many traditional clothing items have been designed like this: the Japanese kimono, the Indian sari, the Romanian female shirt and many other components of traditional costumes.

Zero waste design can be achieved in several ways:

- through the modality of construction and framing of patterns;
- by modeling articles of clothing from modular parts;
- by using threads as raw material.

2.1.1. In the first situation, all parts of a garment are designed and cut so that there is no waste and the amount of fabric is used entirely. Although, all types of clothing items can be obtained through this technique, the process requires a great deal of creativity as well as technical skills. At the same time, it also presents some shortcomings, raising problems when making the same model in different sizes or materials. In one of her articles, designer Holly McQuillan appreciated that „for most companies, it does not make economic sense to invest time (and therefore money) into the development of a design if the likely outcome is not known."[1] She also offered a solution: the transposition of a zero-waste pattern already made in one size, on a grid. In this way, it can be scaled proportionally to be adapted to each type of material and different sizes of wearers. [2]

Conceived entirely as a sustainable collection and, at the same time, as a manifesto collection, through which an x-ray of post-communist Romanian society was intended, the *Entropy* collection, designed by students from the Fashion - Design specialization (Faculty of Visual Arts and Design from Iași) has included pieces made in this way. The project was presented at *TCBL International Conference - Fashion Forward* 2019 (Iași, Romania).

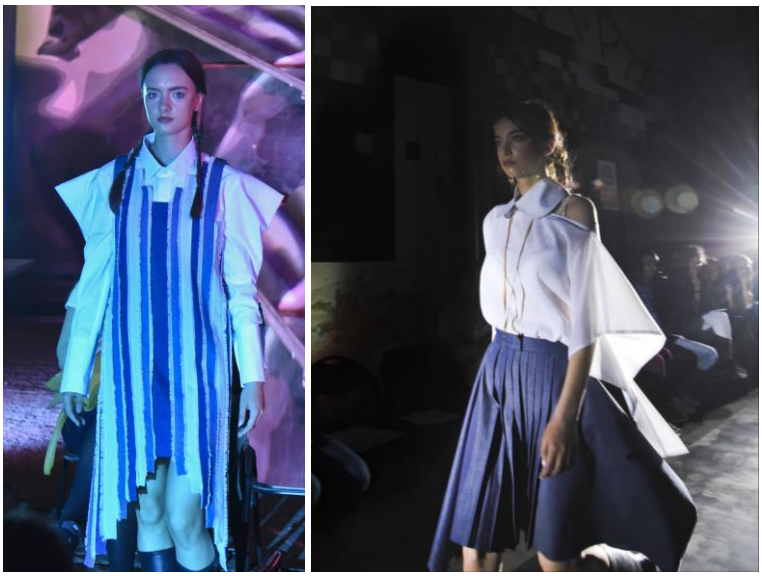

Figure 1. Clothing ensembles - *Entropy* fashion collection, coordinators: associate professor Cornelia Brustureanu / university lecturer Cristina Gabriela Hîrțescu, photo credits: Flod x TCB

2.1.2. The elimination of waste in the design process can also be achieved by modeling and assembling some modular shapes cut from an amount of fabric. The technique involves sectioning the fabric into equal or unequal parts, in various geometric shapes and their assembly using the modeling

on the mannequin method, in order to obtain clothing prototypes. Although it can be seen as a time-consuming or limiting technique, the products made in this way are, in most cases, unique not only in form but also in the resulting textures. Such an example is the collection entitled *Syringa*, made as graduation project, by the student Casița Victor and presented during the *Fashion for Tomorrow Festival*, Iasi, 2023.

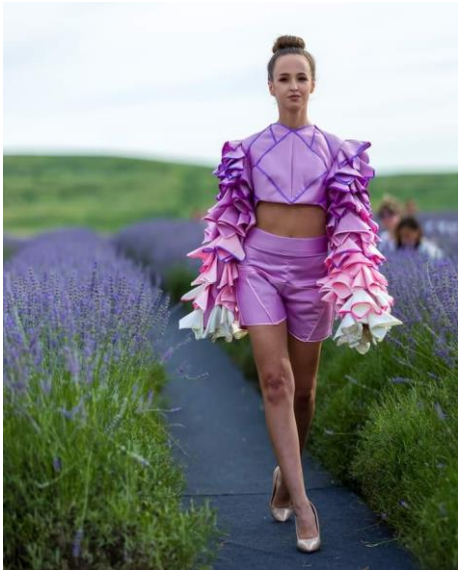

Figure 2. Clothing ensemble – *Syringa* fashion collection, Casița Victor, coordinator: lecturer Cristina Gabriela Hîrțescu, photo credits: *Fashion for tomorrow* Festival

2.1.3. A more convenient method consists in developing products from yarn, using knitting, crocheting or knotting techniques. Experimenting freely, with students, various braiding and knotting techniques have resulted highly creative clothing products and accessories. A shortcoming of this technique would be the high consumption of yarn to obtain an article, but this could be remedied by using recycled threads, recovered from other old products, or by sectioning into strips some out-of-use materials.

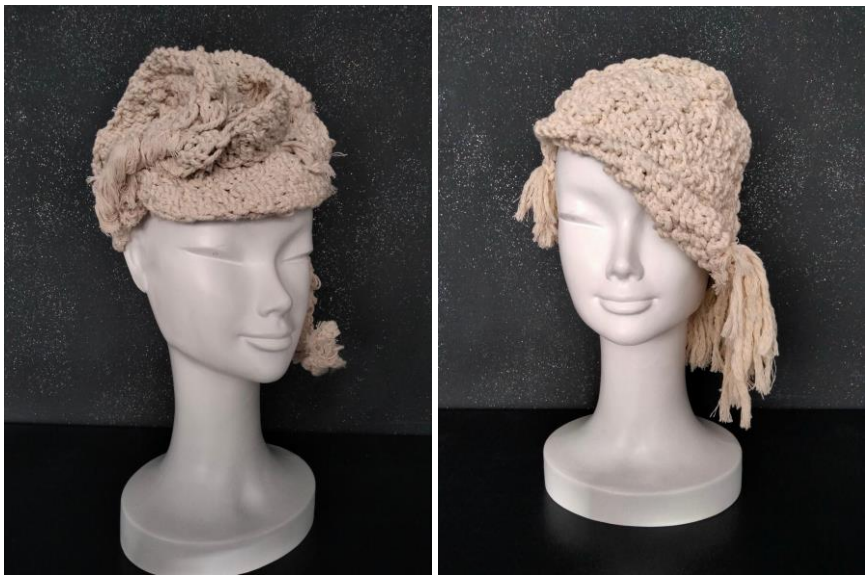

Figure 3. a. Head accesory, Gaciu Teodora / **b.** Head accesory, Mălina Buhuceanu, coordinator: lecturer Cristina Gabriela Hîrțescu

Such strips, obtained by sectioning fabric coupons donated by a garment factory, were also used to create new materials. Woven on an atypical support for clothing design (non-slip mesh intended for fixing carpets on the floor), resulted surfaces with unique textures and ornaments, from which outfits were designed. These were presented in several exhibitions. In addition to using zero waste principle, this process also included the upcycling principle.

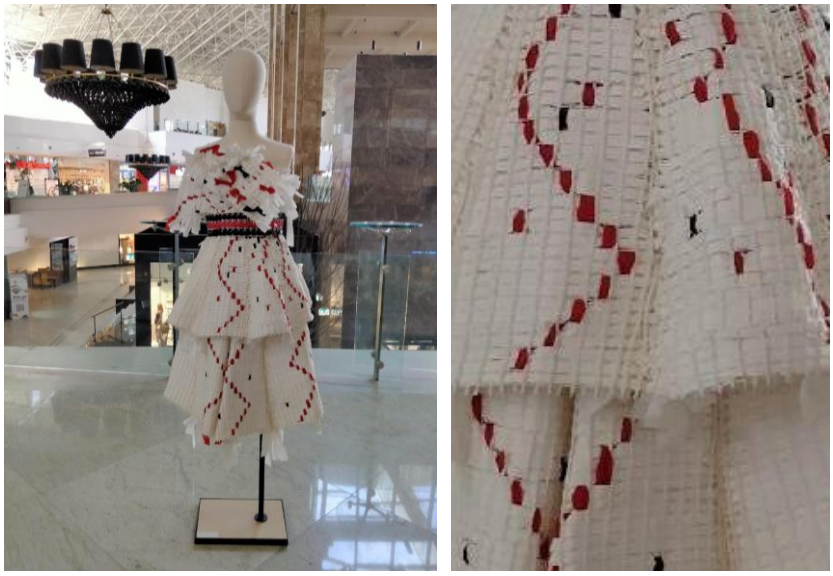

Figure 4. Clothing ensemble, Alexandra Țigăeru, coordinator: lecturer Cristina Gabriela Hîrțescu

New, interesting textures can also be obtained by integrating the waste resulted after tailoring into the composition of the product, as ornamental elements created on its surface. Practically, all the fabric remains resulting from cutting / sectioning / perforation, etc. are reintegrated into the proposed prototype, thus resulting new textures.

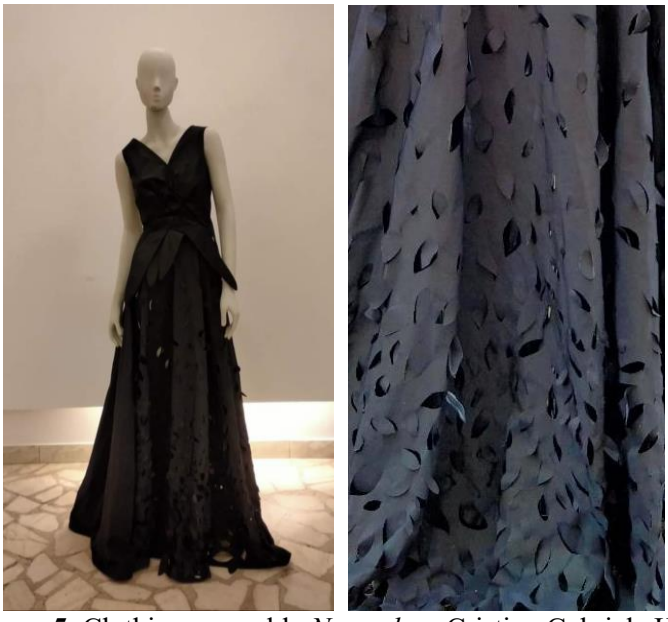

Figure 5. Clothing ensemble *November*, Cristina Gabriela Hîrțescu

2.2. Multi-functional products represent another direction that can be approached in order to produce sustainable clothing. Multifunctional or transformable clothing refers to those products that, by the way they are designed, can be used differently or in different situations. [3] Such products can meet technical or aesthetic needs. The design of multifunctional or transformable clothing involves finding innovative technical solutions for constructing and finishing the forms. Concerned especially with the aesthetic criterion and the constant need of consumers for new, some students were interested in exploring this direction. The collection *Phalaenopsis*, made by Guțu Anișoara, presented at *Fashion for Tomorrow* and *Romanian Creative Week* fashion festivals, is such an example. She designed outfits with two sides, different in color, but also reversible or convertible dresses.

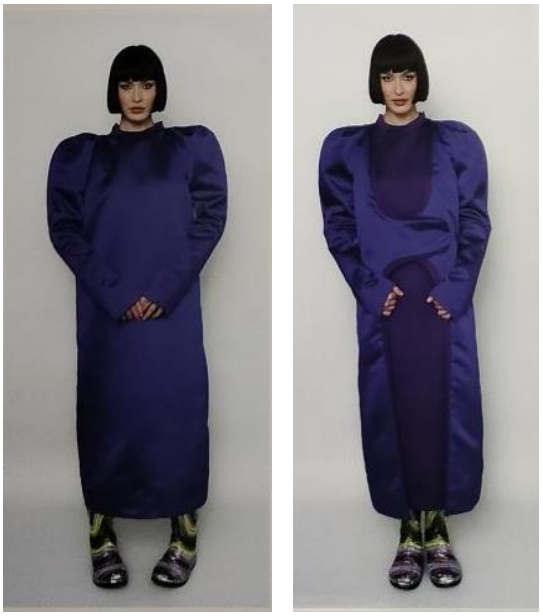

Figure 6. Multifunctional outfit (reversible front - back) – *Phalaenopsis* fashion collection, Anișoara Guțu, coordinator: lecturer Cristina Gabriela Hîrțescu, photo credits: Cristian Rezemeriță, model: Ema Maria Panțiru

*2.3.*Another general approach to sustainable design concerns post-consumption (upcycling and recycling). Upcycling involves the transformation of materials or clothes into new products of equal or superior quality. Applying this principle, the waste generated by throwing away a product (fabric or clothing) is eliminated. In fashion, that means extending the life of products through creativity.

Upcycling principle can involve the use of:
- batches of fabrics that were no longer used by clothing manufacturers for various reasons (they went out of fashion, did not behave properly for the production of certain types of articles, etc.);
- scraps left on a roll of fabric or defective fabrics;
- materials that were not originally intended for clothing;
- old or fashion outdated clothing products that are transformed into new products through deconstruction and reconstruction or restyling.

Therefore, reconstruction is a form of upcycling and is the process of making new clothes from waste resulting from garments (worn or new) but which are no longer of interest to consumers. This process involves first deconstructing the clothes used as raw material and then reconstructing the resulting pieces of fabric into new designs. Because of the raw material used, reconstruction is seen as a limiting process, especially when it comes to the production of garments in large series. This is the reason why many designers choose denim products, as a raw material, available in a very large quantity, whether we are talking about unsold or second-hand products. In this case, large-scale production is possible. When approaching the principle of upcycling, the designer has to think

differently he stages of work, since he has to start from the materials, from the resources at his disposal. Sometimes these are the ones that generate the ideas. In the collection titled *Adaptable*, presented at the *Romanian Creative Week* Festival (2023), student Crina Croitoru approached the principle of reconstruction, transforming out-of-fashion denim items into modern, on-trend ensembles.

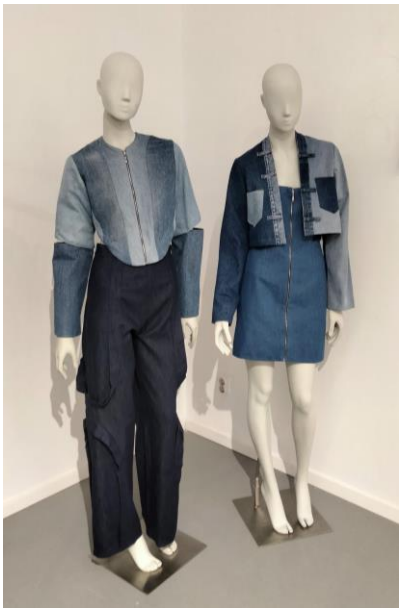

Figure 7. Outfits designed from recycled denim - *Adaptable* fashion collection, Crina Croitoru, coordinator: lecturer Cristina Gabriela Hîrțescu

Re-styling refers to the reintegration into the fashion circuit of some items that are outdated from an aesthetic point of view. Basically, the old product is aesthetically improved, turning into a new, fashionable one. Such an exercise was approached with the students from Iași, who ennobled various common pairs of tennis shoes or rubber boots, by reconfiguring their surfaces with various trimmings. The resulting new pairs of footwear complemented the outfits from the sustainable collections made by the students and presented in several high-profile events.

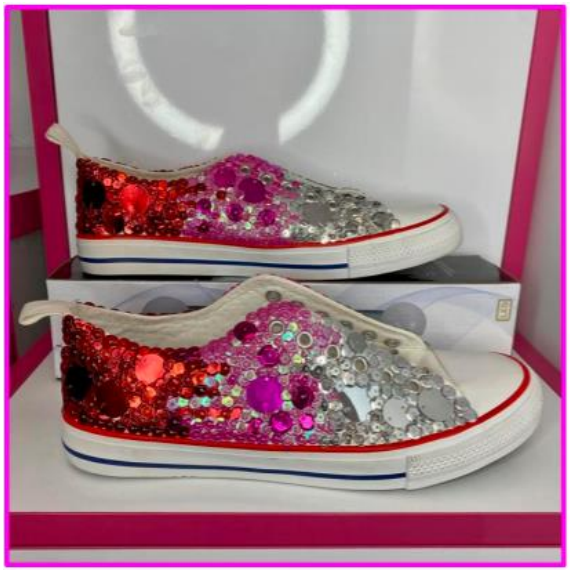

Figure 8. *Risen* project, Iasmina Rîmbu, coordinator: lecturer Cristina Gabriela Hîrțescu

3. Conclusions

It is likely that the mass market clothing manufacturers, under the pressure of the need to produce as much as possible, in the shortest time and at the lowest possible cost, succeed more difficult to implement sustainable design principles in the production process. But, considering that students are not so pressured by deadlines (as happens in the production process) in education, the application of these principles is welcome because the development of such projects not only determines the students, the future designers, to be more responsible in their designs, but it generates creativity and, at the same time, a better understanding of the creative process.

If, usually, in the design process, the sketches are made first, and later they are translated into fabric, in most of these processes, the working stages are reversed. Most of times, when using sustainable principles and methods, designers start from the raw material and techniques used, which bring the inspiration. From the experiments undertaken with students, it is found that this fact contributes to obtaining creative results, because they are freed from the constraints of their own limitations (in illustration or technical).

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